DOCUMENT RESUME

ED 236 548 CS 007 331

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TITLE The Consumption Benefits of Literacy.
PUB DATE 18 Mar 83
NOTE 28p.; Paper presented at the Meeting of the Comparative and International Education Society (Atlanta, GA, March 18, 1983).
PUB TYPE Speeches/Conference Papers (150) -- Reports - Research/Technical (143)

EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS Books; Comparative Analysis; *Consumer Economics; Developing Nations; *Government Role; *Literacy; Newspapers; *Reading Materials; *Social History

ABSTRACT

To determine the consumption benefits of education, this report details a study that explored the cost placed on items or services associated with basic literacy in the nineteenth and twentieth centuries. The first section both explains why consumer prices for books, newspapers, and postage are valid indicators of the consumption benefits of education and outlines the basic approach to be used in the study. After the second section implements this approach to estimate the consumption benefits of acquiring literacy in nineteenth century England, the third section compares the estimate with the pecuniary value and costs of acquiring literacy. It argues that consumption benefits probably outweighed both the pecuniary benefits and the cost of literacy, and that changes in government policy with regard to consumer benefits may have had a stronger impact on the rise of popular literacy than the policy measures usually emphasized, such as school provisions and child labor restrictions. The final section briefly considers modifications and extensions of these conclusions to developing nations in the twentieth century. (MM)

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THE CONSUMPTION BENEFITS OF LITERACY*

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* Presented at the meetings of the Comparative and International Education Society, Atlanta, Georgia, March 18, 1983.

CS 007331

Economists have long recognized that in the cost-benefit analysis of education, the benefit side should include not only the impact of education on work-place productivity and earnings but also consumption components. Such components include not only the initial joy of learning but also a longer term stream of benefits from using education off the job. One could also include as a consumption benefit the possibility that higher levels of education lead to increased utility and satisfaction from one's work as well as increased earnings; but this possibility will not be pursued here. The existence of consumption benefits to education is of potential importance both in accounting for observed levels of educational attainment and in policy analysis that assesses the value of education and that designs policies intended to alter the incentives for acquiring education. The actual importance of considering consumption benefits to education would obviously depend on their magnitude. If consumption benefits exist but are of negligible size relative to the impact of education on earnings, little would seem to be lost from omitting consumption benefits in the cost-benefit analysis of education. However, my own impression is that little is currently known concerning the magnitude of education's consumption benefits. I am only aware of two studies that have attempted to estimate the magnitude of consumption benefits, those of Robert Michael and Edward Lazear.[1] And these studies arrive at opposite conclusions: Michael concludes that consumption benefits are significant; Lazear concludes that the consumption value of education is actually negative. One obvious reason why few attempts have been made to estimate consumption benefits and why those attempts have yielded conflicting conclusions is that the amorphous nature of education's consumption benefits makes it difficult to develop a suitable theoretical framework for their analysis and to locate markets that attach prices or

values to these benefits.

There would seem to be two ways to proceed in attempting to overcome these difficulties. One strategy would be to develop a theoretical model capable of analyzing education's consumption benefits. An alternative strategy would be to look for markets that attach observable values to education's consumption benefits. The studies by Lazear and Michael have emphasized the first strategy. Michael employs the household production model of Becker and Lancaster to analyze consumption benefits. Lazear uses a fairly specific model of the determinants of the wealth maximizing level of educations to assess consumption value by the difference between the wealth maximixing and the actual years of schooling. Although both approaches are valuable and have yielded important insights into the consumption benefits of education, as estimates of the magnitude of that value they are subject to the criticism that the magnitude of their estimates are dependent on the specific assumptions of their models.

This paper emphasizes the alternative strategy to estimating consumption benefits: using market evidence on their magnitude. The paper is organized as follows. The first section outlines the basic approach to be used. The second section implements the approach to estimate the consumption benefits of acquiring literacy in nineteenth-century England, a case I have examined in previous work. The third section compares the magnitude of my estimate of consumption benefits of literacy with estimates of the pecuniary value and costs of acquiring literacy. It argues that consumption benefits were probably not negligible relative to either the pecuniary benefits or the cost of literacy. It also notes that the changes in government policy affecting consumption benefits of literacy may have been a much stronger impetus to the rise of popular literacy than the policy measures that are

usually emphasized, namely school provision and child labor restrictions. The final section briefly considers modifications and extensions of the conclusions from the case of nineteenth-century England to current developing countries.

I

The starting point for the approach taken here to estimating the consumption benefits of education is to note that obtaining those benefits frequently involves the use of other inputs in addition to education. This is perhaps particularly evident for education in the form of basic literacy skills. Reading commonly entails the use of printed matters such as books and newspapers; writing involves pens, pencils and paper - and where letters are involved - postage. This notion could conceivably be extended to higher levels of education. Thus enjoyment of esoteric works in the arts and humanities or the consumption of advanced treatises on pure mathematics and philosophy could be viewed as conditional on specialized training in those areas. But the focus here will be on basic literacy. Inputs associated with basic literacy skills entails consumption benefits insofar as the consumer of those inputs receives what economists refer to as the consumer's surplus from their use. The consumer's surplus arises because the value the consumer derives from consuming the good in question typically exceeds the price he has to pay for it. A standard illustration of consumer's surplus is to note that the person about to use a crowbar to open up a treasure chest would surely be willing to pay for more than the going price in a hardware store for the crowbar.[2] One can point to similar examples for the case of inputs associated with basic literacy. The consumer who comes across a bargain on a used car or locates his dream house in the classifieds may reflect that he would have been

willing to pay for more than the 25 cents it costs to buy the newspaper where he made these discoveries. The surplus obtained is likely to vary with the particular consumption activity involved. The consumer sending off his mail may begrudgingly put a 20 cent stamp on his gas bill while being willing to pay far more than 20 cents to send a letter to a loved one on the other side of the country. Insofar as using consumption inputs such as newspapers or the mails also entails basic literacy, the consumer surplus derived from those inputs can be viewed as a consumption benefit to literacy.

Using the complimentary inputs can be viewed as a consumption activity that also uses literacy as an input. One indication that such a view is appropriate is the existence of rental markets providing literacy services to illiterates. In nineteenth-century England illiterate migrants would get others to write letters to distant relatives, in some cases making payment for the services. Thus Joseph Arch, the famous agricultural union organizer, noted in his autobiography: "A great many of the poor people who had children and relatives away from home, but who could not write to them, used to come to my mother and asks her to write letters for them." Flora Thompson, describing her duties at a turn of a century post office, mentioned that migrant laborers from Ireland would ask her to write a few words back home; and Henry Mayhew describing mid-nineteenth century London stated that hawkers of street literature would also write letters for a penny or two.[3] It can be argued that the maximum amount an illiterate would pay to have a letter written or to have a letter, book, or newspaper read to him would be equal to the consumer's surplus he would obtain from the letter, book, or newspaper. Hence the consumer surplus derived from complimentary inputs such as letters, books, or newspapers can be viewed as a consumption benefit to literacy.

Although the approach just described should be able to capture the

basic dimensions of literacy's consumption value, it is subject to limitations. It relies on the concept of consumer's surplus, a concept which itself has received considerable criticism. The main objection here is that the consumer's surplus construct measures the surplus in monetary units while the valuation in utility terms placed on those monetary units is likely to change as the consumer's income rises due to obtaining more surplus. However, this problem is only likely to be serious when the good in question constitutes a substantial part of total money expenditure.[4] This is unlikely to be the case with the complimentary inputs associated with literacy. A more serious problem in practice is likely to be errors in measuring the demand curve. Another limitation is that many consumption uses of education may either not be directly associated with complimentary inputs or if the association exists, level of usage of the inputs may be hard to measure. Thus the approach is not well suited to capturing the value of the immediate joy of learning. And many objects used in reading and writing may have public good aspects, e.g. street signs or political pamphlets, making it difficult to measure the usage or their demand curves. But despite these limitations it should be possible to capture the value of at least some of the consumption uses of literacy by looking at the nature of the demands for complimentary inputs.

II

I turn now to applying the approach just described to the case of literacy in nineteenth century England. Besides personal familiarity based on previous research, there are a number of other reasons why I turn to this case. First, England in the nineteenth century was what could be labelled a semi-literate society. In 1840, roughly 60 percent of England's adult population appears to have been able to sign their names, by 1900 the proportion was approaching 100 percent. As early as the 1840s, reading materials appear to have been well diffused among the working classes. Surveys of London in the 1840s indicate that the vast majority of working class households owned books and took in newspapers. Surveys of rural areas also indicated that most farm laborers owned books (despite literacy rates under 50 percent for this group), although they were primarily confined to basic religious books; newspapers or reading for pleasure appear to have been much less common in rural areas than the cities.[5] That England at this time was semi-literate is relevant because it would suggest that the bulk of the population was at least aware of the possibilities of reading and writing even if not possessing those skills. Thus issues related to the diffusion of information concerning literacy or of fundamental change in outlook due to entering an educated society are of less concern than in societies where substantial segments of the population may have virtually no contact with literates. In addition, since literacy rates rose markedly in nineteenth century England, it provides the opportunity to consider the impact of any changes in consumption value on the rise of literacy.

A second general reason for interest in the case of nineteenth century England, is that the prices of books, newspapers, and postage fell markedly over time. By matching the changes in prices with changes in

quantity, one can attempt to map out the demand schedules for books, newspapers, and postal services. Newspaper prices fell on account of the removal of the Stamp Tax and to some extent because of improvements in printing technology and paper production. By 1815 the stamp tax on newspapers had reached four pence a copy, supplemented by further taxes on advertising. In 1836 the stamp tax was lowered to one pence and in 1855 it was abolished. Correspondingly, newspaper prices fell. Whereas in 1830 a copy of the London Times has cost seven pence, in 1870 it only cost three pence. Working class periodicals such as Lloyd's Weekly Newspaper sold for three to four pence a copy in the 1840s but only one pence a copy following the removal of the stamp tax in 1855.[6] The fall in postal rates was perhaps even more marked than for newspapers. In the first third of the nineteenth century the monopoly position of the Royal Post Office was used to generate revenue over and above the cost of the service. By the 1830s, the typical cost of a letter had reached seven to eight pence, the cost varying with the distance sent and the number of sheets in the letter. Following the postal reform initiated by Rowland Hill in 1839, the cost of sending a letter within England fell to a uniform one penny for the first half ounce.[7] The introduction of the steam press, the replacement of machine made for hand made paper, the lifting of paper duties, and the decision of publishers to aim for the mass market were all lowering book prices during the nineteenth century. Charles Knight estimated that the average price of a complete book fell from 16 shillings in 1828 to 8 shillings in 1853, and the introduction of reprints and novels in serial forms would have lowered the effective price even further. These price ranges indicate that Knight's estimates refer to book for the upper and middle classes, as few manual workers would have been likely to pay even 8 shillings for a book. However, the same forces lowering the prices of books for the

wealthier elements in society also seem to have improved the quality of the 1 to 6 penny literature aimed at the working classes. Whereas in 1820, the penny might have bought a broadside consisting of one sheet with a few verses describing the trial of Dick Turpin, by 1850 a penny could have bought a Gothic romance of 50 to 100 pages and a writing style superior to the broadside doggerel.[8]

Following these price falls, the use of books, newspapers and the mail increased markedly. With the reduction of the stamp tax from 4 pence to 1 pence in 1836, the number of newspaper stamps issued increased from 32 million in 1836 to 44 million in 1837 and reached 70 million in 1847.[9] The removal of the stamp tax in 1855 also removed the only indicator of aggregate newspaper circulation at this time (the number of newspapers stamps); however, the circulation statistics of Lloyd's Weekly Newspaper, one of the leading working class papers, provides an indicator of the impact of removing the stamp tax. In 1843, when Lloyd's was first published for 3 pence a copy, its weekly circulation was 21,000 copies. Its circulation had increased to 90,000 copies in 1853. Following the lifting of the stamp tax in 1855, Lloyd's lowered its price from 3 pence to 2 pence and consequently its circulation grew to 170,000 in 1861. In the same year, anticipating the removal of the paper duty, Lloyd's reduced its price to a penny and over the next 2 years its circulation more than doubled, reaching 350,000 in 1863. It took more than 20 years for Lloyd's circulation to double again and reach its 1886 level of 750,000 copies.[10] In 1839, before the postal reform, 60 million letters were delivered in England and Wales. In 1840, one year after the postal reform, the letters delivered rose to 132 million and reached 1 billion in 1881. This translated into a tenfold increase in letters per capita between 1839 and 1881.[11]

Having suggested that large falls in the prices of books, newspapers, and the mails markedly increased their usage over the nineteenth century, the task remains of using this information to make inferrences about the demand curves of individual consumers for these materials. My analysis will focus on people who before the major price falls between 1830 and 1855 in England would have made no use of books, newspapers or the mails. Focussing on such a group allows examination of the full range of variation along their demand curves and hence makes it possible to measure their total consumer's surplus from using the various materials considered. The individual demand curve for each of the media considered can be inferred by first estimating the highest price at which the consumer would want to buy the media material in question. This price can be estimated using information on prices before the major price falls. By observing price and estimating quantity consumed after the price falls one can then obtain a second point on the demand schedule for the media material in question. By assuming a linear demand schedule, one can then infer the entire schedule. With an estimate of the demand schedule for the particular media material one can then estimate the consumer surplus obtained from purchasing material after the price fall. The magnitude of this surplus will be given by 1/2 times the change in price times the quantity consumed after the price fall. As quantity here will be measured per year, the expression just mentioned gives the annual flow of consumer's surplus. One can then use estimates of life expectancy and internal discount rates to convert this annual flow into the lifetime present value of consumer's surplus from using a particular media material. By summing the present value estimates over the various types of media on which information is available one then has at least a partial estimate of the consumption value derived from literacy. Such an estimate will be subject to uncertainty for a number of

reasons. First, many consumption uses of literacy will undoubtedly be omitted simply because of lack of information on complimentary inputs to these uses. Second, the estimate implicity assumes that the demand schedule[5] for media materials was not shifting, although in fact they probably were shifting out during the period of the price fall. Both of these factors cause the consumer's surplus estimates that follow to be underestimates. In addition, the assumption of linear demand schedules is a potential source of error although the direction is uncertain.

Implementing the estimate requires information on prices and individual consumption of media material before and after the price fall and on life expectancies and internal discount rates. Each of these variables probably diferred from person to person and for a given person over the life cycle. Consequently what follows will consider the plausible range of values for these variables following the major price falls of 1830-1850. The lower limit of the consumer's surplus gain was undoubtedly zero, since even after the price falls there were surely some literates who made no use of books, newspapers or the mail.[12] To examine the range of positive values for the consumer's surplus gain, consideration will be given in turn to the price before the price fall, the price after the price fall and the quantity consumed after the price fall for newspapers, books, and letters; and life expectancy from age of acquiring literacy and to the internal discount rate.

Newspapers

The upper limit for annual usage after the price fall was probably set by the 369 annual issues for a given daily newspaper and the 52 annual issues for a given weekly. These limits could have been exceeded through reading more than one given newspaper per day or per week; however, this was

probably not the common practice for the working class reader. Indeed, most accounts suggest that before 1890, working class readers read primarily weeklies rather than dailies.[13] Average usage rates can be examined by using stamp tax statistics to estimate newspaper circulation per literate adult. Annual newspaper circulation per literate adult can be estimated at 10 in 1841 and 20 in 1851.[14]

The upper limit for the maximum price a working class reader would pay for a newspaper is probably given by the 4 pence maximum price at which working class newspapers sold in the 1830s and 1840s. The actual price after the price fall probably did not fall below 1 penny in most cases, although a few working class periodicals did come out for a half penny.[15]

Books

The range of possible book prices and consumption levels was particularly wide. It is not beyond the realm of possibility that some working class readers devoured 3 or 4 novels a day or paid out 30 shillings for a new copy of Ivanhoe in the 1830s; however, such occurences were surely quite rare. Some guidance on usage after the 1830-50 price falls is provided by a description by Flora Thompson of the reading habits of women in her Oxforshire halmet in the 1880s.[16] Thompson suggests that each woman purchased a penny novelette each week, implying purchases of 52 per year. However, as Thompson's description refers to swapping among readers, one suspects that an avid reader in a situation where reading matter could not be exchanged would have purchased even more. In the absence of additional information, the consumption of 52 books a year will be taken as a likely candidate for usage after the price fall for an avid reader in the late nineteenth century, although to allow for particularly voracious readers, a range of up to 150

books per year will be considered.

The range of prices that working class readers would have been willing and actually did pay for books, is also hard to gauge. Mayhew reports that used books aimed at working class readers in London sold for 1 or 2 shillings (Mayhew mentions that working class readers would not have bought these books new).[17] It is not inconceivable, however, that particularly avid working class readers purchased the 5 shilling reprints aimed at the middle classes, and so 5 shillings will be used here as an upper limit to the maximum price a working class reader would have paid. A lower range for book prices after 1850, would be the 1 to 6 pence charged for pamphlets and novelettes.[18]

Letters

An upper limit for working class letter consumption after the 1839 postal reform would be provided by Post Office statistics on letter delivery. In 1881, letters delivered per capita were 40, which would translate into approximately 144 per literate.[19] This, however, overstates working class consumption of letters, as a disproportionate amount of the annual volume of letters was almost surely accounted for by the middle and upper classes as well as business mail. Flora Thompson provides some guidance on working class letter writing patterns in the 1880's. In describing her village, she referred to young men writing weekly love letters, and at another point to daughters in domestic service sending home money once a month. She also refers to the postman telling one hamlet resident particularly eager for mail that she had received a letter "just last week". An estimate of average delivery in the hamlet can be made from Thompson's statement that for the entire hamlet consisting of about 30 cottages, daily delivery was "at best 2 or 3 letters."[20] Assuming 250 delivery days per year, Thompson's statement

would suggest a maximum delivery of 750 letters per year for the hamlet or 25 per household. The upper limit for usage after the postal reform, then, was problably no more than 100 letters per year, with few working class households receiving more than one letter per week.

As mentioned above, postal rates in the 1830's before the 1839 postal reform averaged 7 to 8 pence per letter. This was probably towards the upper limit for what a working class person would have been willing to pay contemporary reports indicate that the working classes were not willing to pay prevailing postal rates at this time. After the postal reform, a letter could cost as little as a penny to send anywhere in England.

Converting to Present Values

The previous discussion has presented estimates of the components of the annual flows or consumer's surplus from using reading and writing materials. To convert these annual flows into present values one requires estimates of life expectancies and internal discount rates.

Age specific life expentancy estimates for England have been made by Warren Thompson. Thompson estimated that over the period 1839-54 a 10 year old could have expected to live to age 47.[21] If literacy was acquired at age 10, this estimate suggests that in nineteenth century England literacy would have provided a consumption stream for roughly 35 to 40 years. Allowance will be made here for variation in life expectancies by considering consumption streams ranging from 25 to 50 years.

I can see no good way to get direct evidence on the appropriate internal discount rate. Although there would seem to be no clear upper bound for an internal discount rate on the literacy consumption stream, discount rates of 5, 10, 15 and 20 percent are considered here to establish how

sensitive the present values of the consumption streams would have been to alternative values for the discount rate.

The components of the consumption benefit expression are used to estimate the range of present values for the consumption benefits to literacy in tables 1, 2, 3, and 4.

The possible range of present values implied is considerable from zero as initially suggested up to 474.5 pounds for a consumer facing the maximum price and quality changes in each of the annual flow tables and the particularly favorable discount rate and usage period of 5 percent and 50 years in the present value table.[22] Although such a wide range communicates little more than agnosticism about the consumption value of literacy, consumption at levels in upper end of the range, though not impossible, was probably only characteristic of unusually motivated working class readers, and in particular, readers who would have read actively even before the 1830-50 price falls. A plausible upper range of consumption in the second half of the nineteenth century for an active working class reader might have been 52 newspapers, 52 novelettes and 26 letters a year. Most working class readers read only weekly newspapers until the 1890's, as stated above. The women in Flora Thompson's hamlet purchasing novelettes weekly seem to have been particularly avid readers, and few in the hamlet seem to have received a letter more than every two weeks.

Using an upward biased discount rate of 5 percent and usage period of 50 years as well as plausible upper limits for the price change and usage after the price change yields an estimate for the present value of consumption benefits to literacy of 25.33 pounds. Evidence is too sparse to state with any certainty how the consumption value of literacy for the English working classes would have been distributed below this upper limit. However a

evidence that newspapers were spreading into rural villages during this time as well as the increasing proportion of farm laborers after 1850 with daughters in domestic service sending letters home, makes it likely that a substantial proportion of the working classes had expected consumption benefits considerably above zero. Perhaps a reasonable estimate of the typical value would be half of the upper bound estimate just presented of 12.5 pounds.

TABLE 1

RANGE FOR THE ANNUAL FLOW OF CONSUMER'S SURPLUS FROM NEWSPAPERS

Annual Usage Rates	Price Change in Pence			
	1	2	3	4
0				
5	5	10	15	20
10	10	20	30	40
15	15	30	45	60
20	20	40	60	80
30	30	60	90	120
40	40	80	120	160
50	50	100	150	200
100	100	200	300	400
150	150	300	450	600
200	200	400	600	800
250	250	500	750	1000
300	300	600	900	1200
350	350	700	1050	1400

TABLE 2

RANGE FOR THE ANNUAL STREAM OF CONSUMER'S SURPLUS FROM BOOKS

Annual Usage Rates	Price Change in Pence											
	1	2	3	4	5	6	12	18	24	36	48	60
0												
5	5	10	15	20	25	30	60	90	120	180	240	300
10	10	20	30	40	50	60	120	180	240	360	480	600
15	15	30	45	60	75	90	180	270	360	540	720	900
20	20	40	60	80	100	120	240	360	480	720	960	1200
30	30	60	90	120	150	180	360	540	720	1080	1440	1800
40	40	80	120	160	200	240	480	720	960	1440	1920	2400
50	50	100	150	200	250	300	600	900	1200	1800	2400	3000
75	75	150	225	300	375	450	900	1350	1800	2700	3600	4500
100	100	200	300	400	500	600	1200	1800	2400	3600	4800	6000

TABLE 3

RANGE OF THE ANNUAL STREAM OF CONSUMER'S SURPLUS FROM LETTERS

Annual Usage Rates	Price Change in Pence							
	1	2	3	4	5	6	7	8
0								
5	5	10	15	20	25	30	35	40
10	10	20	30	40	50	60	70	80
12	12	24	36	48	60	72	84	96
15	15	30	45	60	75	90	105	120
20	20	40	60	80	100	120	140	160
30	30	60	90	120	150	180	210	260
40	40	80	120	160	200	240	280	320
50	50	100	150	200	250	300	350	400
100	100	200	300	400	500	600	700	800
150	150	300	450	600	750	900	1050	1200
200	200	400	600	800	1000	1200	1400	1600
250	250	500	750	1000	1250	1500	1750	2000

TABLE 4

CONVERSION FACTORS FOR GOING FROM CURRENT FLOWS TO PRESENT VALUES

$$\frac{1 - (1/1-r)^n}{1 - (1/1-r)}$$

n	r			
	.05	.10	.15	.20
25	15.733	9.978	7.405	5.926
30	17.140	10.363	7.521	5.963
35	18.240	10.604	7.578	5.978
40	19.115	10.747	7.606	5.984
45	19.790	10.839	7.620	5.986
50	20.333	10.896	7.627	5.987

Note: n is the years of usage,
r is the internal discount rate.

III

To put the consumption benefit estimates just presented into perspective I turn now to comparing these estimates with estimates for the pecuniary benefits and the costs of literacy.

One issue in such comparisons would be to consider whether the consumption benefits of literacy alone would hve been large enough to justify incurring the cost of acquiring literacy. I have estimated elsewhere that the total cost of acquiring literacy in nineteenth century England ranged from 6 to 14 pounds with an average of 10 pounds. This total was composed of direct tuition costs ranging from .5 to 1.8 pounds and opportunity costs ranging from 6 to 12 pounds.[23] Thus with consumption benefits typically at 12.5 pounds and plausibly as high as 25 pounds, those benefits alone may have been sufficient incentive for people in the English working classes to acquire literacy.

A second issue is the relative importance of pecuniary versus consumption benefits as incentives for acquiring literacy. Elsewhere I have estimated that the expected pecuniary benefits of literacy for an Englishman of humble background in the nineteenth century ranged from 7 to 100 pounds with a mean value of around 50 pounds.[24] Expected pecuniary benefits do appear to have been larger than expected consumption benefits. But the consumption benefits were possibly at levels 25 to 50 percent of the pecuniary benefits and thus were by no means a negligible proportion of total benefits. Moreover considerable uncertainty appears to have been associated with the pecuniary benefits. Elsewhere I have compared earnings of literate and illiterate sons of laborers during this time period. This work suggests that although ex ante literacy did offer a positive expected wage premium, as many as half of all literate sons of laborers[25] received no wage premium for their literacy. Thus it appears that literacy had to interact with other

factors such as ability or specific skills to command a wage premium. Although the consumption benefits of literacy was surely also subject to considerable individual variation, the pervasiveness of access to newspapers, books, and postage discussed above may have been strategic in providing those in the lowest social classes with little hope of using literacy in the labor market other incentives for acquiring literacy.

A third issue in interpreting the consumption benefit estimates arises from noting that much of the decline in prices in newspapers and postage can be attributed to government policy: in particular lowering and then eliminating newspaper taxes and reducing postal rates. The question arises of the magnitude of the impact of these policy changes compared with other government policies affecting incentives to acquire literacy. The most obvious of these other policy changes was state provision of subsidized schooling and restrictions on child labor. One can estimate the consumer's surplus gain from the falling newspaper taxes and postal rates as a present value of about 2 to 7 pounds. Elsewhere I have estimated that the fall in tuition costs of literacy due to provision of subsidized schooling was about 1 pound.[26] The fall in opportunity costs due to child labor legislation is more obscure. The fall could have been as high as 10 to 15 pounds if the legislation was strictly enforced and applied in situations with relatively high opportunity costs. However, the actual impact was probably considerably lower due both to weak enforcement and abundant opportunities for child labor in areas not directly regulated by parliamentary legislation. Thus through apparently indirect channels, the impact of government policy on the consumption benefits of literacy may have been a far more important factor in the rise of popular literacy in nineteenth century England than the far more obvious channels of school provision and child labor legislation.

IV

These results for nineteenth century England would suggest that consumption benefits should also be considered in analyses of literacy in currently developing countries. However this conclusion must be tempered by noting some obvious differences between the situation in nineteenth century England and that in many developing countries.

First, many developing countries today have substantially lower literacy rates than England in the nineteenth century. As recently as the 1960s, some African countries had literacy rates under 10 percent and many were in the 10 to 20 percent range. Such populations almost surely have far less contact with literates or literacy materials than illiterate Englishmen in the nineteenth century. Consequently in situations of improved access to a lower cost of literacy materials, considerations related to the diffusion of information concerning the basic nature of literacy and to basic shifts in outlook associated with encountering literate culture are likely to be far more important than they were for the case of nineteenth century England.

Second, in the twentieth century traditional printed and written media face increasing competition from electronic media. In currently developing countries the most important competitor is probably the radio. Many population groups in developing countries may have better access to radios than to printed matter or the mails. Since the radio would not seem to require literacy, this would seem to be a force lowering the consumption benefits of literacy. At the same time the existence of competing forms of communciations media may provide a policy tool by which governments can affect incentives to acquire literacy. Subsidizing printed relative to electronic media may be an important indirect way of increasing the benefits and hence the incentives to acquire literacy.

Footnotes

1. See Robert T. Michael, "Education in Nonmarket Production," Journal of Political Economy 81 (March/April, 1983): 306-27 and Edward Lazear, "Education: Consumption or Production?" Journal of Political Economy 85 (June, 1977): 569-98.

2. George Stigler, The Theory of Price, Third Edition (New York: MacMillan, 1966), p. 78.

3. Joseph Arch, The Story of His Life Told by Himself (London: Hutchison & Co., 1898), p. 9; Thompson, Lark Rise to Candleford, p. 471; Mayhew, London Life and Labour, pp. 268-9.

4. For a discussion of potential biases of the consumer's surplus measure see R.O. Willig, "Consumer's Surplus Without Apology," The American Economic Review 66 (Sept., 1976): 589-97.

5. On the usage of printed matter in London see "Report of an Investigation into the State of the Poorer Classes of St. George's-in-the-East," Journal of the London Statistical Society 11 (August, 1848): 216. On printed matter in rural areas see G.R. Porter, "Results of an Inquiry into the Condition of the Labouring Classes in 5 Parishes in the County of Norfolk" Central Society of Education Third Publication of 1839.

6. For trends in newspaper prices see Altick, The English Common Reader, chaps. 14, 15, and Appendix A; also, Henry Richard Fox Bourne, English Newspapers: Chapters in the History of English Journalism (London: Chatto and Windus, 1887) 2: 112, 122-24, 235, 253-54.

7. For a discussion of postal rates see Kay, Royal Mail, pp. 73-79; and Hemmeon, British Post Office, p. 147.

8. For a discussion of book prices in the nineteenth century see Altick, The English Common Reader, chaps. 12 and 13; Charles Knight, The Old Printer and the Modern Press, Pt. II, chaps, 4, 6, For a discussion of changes in working class penny literature in the nineteenth century see Neuberg, Popular Literature, Chap. 4; Louis James, Fiction for the Working Man, 1830-50, (Oxford: Oxford University Press, 1974; reprinted, Penguin University Books, 1974), chaps. 2-4. The question of whether the fall in prices described in the text were fully exogenous or were in part caused by the rise of mass literacy will not be examined here, although it should be investigated further. In mapping out the fall in prices, the effect of general price level changes has not been considered. However, between 1830 and 1870, the main period under consideration here, there was no clear trend in the general price level. See Mitchell and Deane, Abstract of British Historical Statistics, pp. 471-72.

9. For evidence on the movement of circulation with the stamp tax, see A.P. Wadsworth, "Newspaper Circulations, 1800-1954," Transactions of the Manchester Statistical Society, Session 1954-55 (March, 1955), pp. 3-23; Bourne, English Newspapers 2: 67; Altick, The English Common Reader, Chaps. 14, 15, and Appendix C. Also see Great Britain, Parliamentary Papers, 1851, vol. 17, Cmnd. 558, pp. 161, 183.

10. For Lloyd's price and circulation see Bourne, English Newspapers, 2: 122, 254; and Altick, The English Common Reader, pp. 394-95.

11. See Great Britain, Parliamentary Papers, 1883. vol. 22, Cmnd. C-3703, p. 26.

12. Instances recurred in parliamentary investigations in the second half of the nineteenth century of people who had learned to read and write as

children and lost these skills as adults through lack of use. See, for example, Great Britain, Parliamentary Papers, 1868-9, vol. 13, Cmnd. 4202-I, p. 276.

13. On the dominance of weekly newspapers among the working classes until the 1890s see Altick, The English Common Reader, p. 355, and Williams, The Long Revolution, p. 193.

14. Calculated by using stamp tax figures in Great Britain, Parliamentary Papers, 1851, vol. 17, Cmnd. 558, Appendix number 4, p. 524, annual newspaper circulation, and population over 20 times proportion signing at marriage to estimate the number of literates.

15. See Altick, The English Common Reader, Chaps. 14, 15; Bourne, English Newspapers, pp. 253-254; and Wadsworth, "Newspaper Circulations," pp. 18-18.

16. Thompson, Lark Rise to Caldleford, p. 109.

17. Maybew, London Life and Labour, p. 296.

18. Altick, English Common Reader, chap. 13; Neuberg, Popular Literature, chap.4; and James, Fiction for the Working Man, chap. 3.

19. Letter delivery statistics from Great Britain, Parliamentary Papers, 1883, vol. 22, Cmnd. C-3703, p. 26. Number of literates calculated by multiplying population over 20 by 1840 literacy rate in Fourth Annual Report of the Registrar General, pp. 19-21. This is a clear understatement incorporated to deal with changing vintages.

20. See Thompson, Lark Rise to Candleford, pp. 101, 167, 165.

21. Warren S., Thompson, Population Problems, Second Edition, (New York: McGraw-Hill, 1935), p. 221.

22. See David Mitch, "The Spread of Literacy in Nineteenth Century England," Ph.D. dissertation, Department of Economics, The University of Chicago, 1982, Chapter VIII.

23. See ibid.

24. See :The Spread of Literacy in Nineteenth Century England," Chapter II.

25. See "The Spread of Literacy in Nineteenth Century England," Chapter VIII.

26. The calculation assumes consumption of 350 newspapers a year, that the price change for newspapers was 4 pence, consumption of 100 letters a year and the price change for letter of 8 pence, and consumption of 150 books a year and a price change for books of 5 shillings, along with a 5 percent discount rate and 50 year usage period.